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10/590,260

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7590  
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03/23/2009

EXAMINER

LEE, CHUN KUAN

ART UNIT

PAPER NUMBER

2181

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03/23/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/590,260	<b>Applicant(s)</b> JOHANSEN ET AL.	
	<b>Examiner</b> Chun-Kuan Lee	<b>Art Unit</b> 2181	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,8-13,16,17 and 19-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,8-13,16,17 and 19-22 is/are rejected.
- 7) ☒ Claim(s) 1,3,9,16,17 and 19-22 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 August 2006 and 24 July 2008 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### **CONTINUED EXAMINATION UNDER 37 CFR 1.114**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/17/2009 has been entered.

### **RESPONSE TO ARGUMENTS**

2. Applicant's arguments with respect to claims 1, 3-4, 8-13 and 20-22 have been considered but are moot in view of the new ground(s) of rejection. Applicant's arguments with respect to claims 16-17 and 19 have been fully considered but they are not persuasive. Please note that the examiner is responding to the most recently updated claims and remarks from the applicant dated 02/17/2009 for the current examination.

3. The instant application having Application Number: 10/590,260 filed on 08/18/2006 has a total of 15 remaining claims pending for examination, wherein claims 2, 5-7, 14-15 and 18 are canceled, and claims 1, 3-4, 8-13, 16-17 and 19-22 are

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pending for examination; there are 3 independent claims and 12 dependent claims, all of which are examined below.

4. In response to applicant's arguments (on page 8-9) with regard to the independent claims 16 and 19 rejected under 35 U.S.C. 103(a) that the combination of the references does not teach/suggest the claimed feature "a junction," because Sitte's junction does not form part of a cable unit, such that the junction is connected to a branch cable having second end which is connected an electrical connector that in turn is removably connectable to a device, as the sensors (Fig. 11, ref. 702, 720) are hard-wired (i.e. not removably connectable); applicant's arguments have fully been considered, but are not found to be persuasive.

The examiner respectfully disagrees, because Sitte does teach a junction (Fig. 1, ref. 20) is connected to a branch cable (e.g. cabling to the corresponding device 22, 26, 30, 34 of Fig. 1) having second end which is connected an electrical connector that in turn is removably connectable to a device (Fig. 1; Fig. 11; col. 4, ll. 39-45; col. 7, l. 8 to col. 8, l. 51 and col. 15, l. 18 to col. 17, l. 49), wherein the devices are removably connectable as the devices can be replaced or added.

#### **I. OATH / DECLARATION**

5. The oath/declaration has been reviewed by the examiner and is found to comply with the provisions of 37 CFR 1.63.

## **II. FOREIGN PRIORITY**

6. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

## **III. DRAWINGS**

7. The drawings are objected to because the elements in Figure 1 are not clearly distinguishable. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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8. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: element 91b in Figure 4; and element 30 in Figure 5. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

9. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: elements 92a and 104 in Figure 7. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are

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not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

#### **IV. SPECIFICATION**

10. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

11. The disclosure is objected to because of the following informalities:

multiple instances in the Specification refer to a plurality of abbreviations without clearly indicating what those abbreviations stands for; the plurality of abbreviations include FPSO, RAM, EPROM, EEPROM and CAN; the examiner suggest the following amendments to the Specification to clarify the above abbreviation: RAM (random access memory), EPROM (erasable programmable read-only memory), EEPROM (electrically erasable programmable read-only memory) and CAN (controller area network); additionally, the examiner is not fully clear how FPSO stands for "production vessel";

on page 6, element 92 is utilized for referencing "harness unit" (in line 10) and complementary connector (in line 34); correction is needed to clearly indicate what element 92 is referencing; and

on page 8, line 14, it is not fully clear where module 30 in figure 5 is shown, the examiner suggests amending the Specification to remove referencing of module 30 or adding module 30 to Figure 5.

Please note that the request for the replacements as stated above is for the purpose to improve the clarity of the Specification. Appropriate correction is required.

## **V. OBJECTIONS TO THE CLAIMS**

12. Claim 1, 3, 9, 16-17 and 19-22 are objected to because of the following informalities:

in claim 1, line 9, "... wherein each device comprises ..." should be replaced with -... wherein each one of the devices comprises ...-;

in claim 1, line 12, "... with each device over the common bus ..." should be replaced with -... with each one of the devices over the common bus ...-;

in claim 3, line 2, "... each cable unit comprises ..." should be replaced with -... each one of the cable units comprises ...-;

in claim 9, line 2, "... a CAN bus ..." should be replaced with -... a CAN (controller area network) bus ...-;

in claims 16 and 19, line 8, "... wherein each device comprises ..." should be replaced with -... wherein each one of the devices comprises ...-;

in claims 16 and 19, line 11, "... with each device over the common bus ..." should be replaced with -... with each one of the devices over the common bus ...-;



in claims 16 and 19, line 13, "... each of which comprises a first end that is connected ..." should be replaced with "... each of the plurality of branch cables which comprises a first end that is connected ...-;

in claim 17, line 2, "... said branch cable further ..." should be replaced with "... said branch cables further ...-;

in claim 19, line 20, "... routed through each said electrical connector and said junction ..." should be replaced with "... routed through said corresponding electrical connector and said junction ...-; and

in claims 20-22, line 2, "... at least one electrical connector comprises ..." should be replaced with "... said corresponding electrical connector comprises ...-.

Please note that the request for the replacements as stated above is for the purpose to improve the clarity of the claim language. Appropriate correction is required.

## **VI. REJECTIONS BASED ON PRIOR ART**

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 1, 3-4, 8-9, 11-13, 16-17 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Sitte (US Patent 5,469,150), Suganuma et al. (US Patent 7,349,479).

14. As per claim 1, AAPA teaches a control system for a subsea installation, the control system comprising:

a control module (Specification, p. 1, ll. 8-33); and

a plurality of devices (e.g. sensors, actuators) which are connected to the control module (Specification, p. 1, ll. 8-33).

AAPA does not teach the control system comprising: a common bus ... the plurality of devices are each removably connectable to the common bus ... a bus controller having a unique address ... means for communicating with each one of the devices over the common bus ... an end termination ... .

Sitte teaches a control system comprising:

a common bus (Fig. 1, ref. 10 and Fig. 11, ref. 770, 772, 780, 782) which is connected to a control module (e.g. programmable control logic (PLC) 12 of Fig. 1) and which comprises a number of cable units (e.g. cable units are between the T-connectors), including a last cable unit which is located at a distal end of the common bus (e.g. last cable unit connected to photoelectric device 29 on Fig. 1) (Fig. 1; col. 7, l. 8 to col. 8, l. 51 and col. 15, l. 18 to col. 17, l. 49); and

a plurality of devices (Fig. 1, ref. 14, 16, 18-19, 21-22, 26-27, 29-30, 34) which are each removably connectable (e.g. via replacement or addition) to the common bus (Fig 1, ref. 10) (col. 7, l. 8 to col. 8, l. 51 and col. 15, l. 18 to col. 17, l. 49);

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wherein each one of the devices comprises a bus controller having a unique address (e.g. identification bits) (Fig. 5-8, ref. 220-230; Fig. 11, ref. 220-230; col. 4, ll. 63-66; col. 11, l. 46 to col. 13, l. 22 and col. 15, l. 18 to col. 17, l. 49);

wherein the control module (Fig. 1, ref. 12) comprises means for communicating with each one of the devices over the common bus (Fig. 5-8, ref. 220-230; Fig. 11, ref. 220-230; col. 7, l. 8 to col. 8, l. 51; col. 9, ll. 39-64; col. 13, ll. 17-22 and col. 15, l. 18 to col. 17, l. 49), as the programmable control logic communicate via forwarding commands to the devices or receiving data from the devices; and

wherein the common bus further comprises an end termination, which is removably connectable to the distal end of the last cable unit (e.g. last cable unit connected to photoelectric device 29 on Fig. 1) (Fig. 1; col. 7, l. 8 to col. 8, l. 51 and col. 15, l. 18 to col. 17, l. 49).

It would have been obvious for one of ordinary skill in this art, at the time of invention was made to include Sitte's control system configuration into AAPA's subsea installation for the benefit of utilizing the Controller Area Network (CAN) protocol which permits efficient communication between individual devices including sensors and actuators at a faster data rate in a high security environment (Sitte, col. 2, l. 59 to col. 3, l. 5 and col. 4, ll. 1-38) to obtain the invention as specified in claim 1.

AAPA and Sitte do not teach the control system comprising a termination hub for electrically terminating the common bus.

Suganuma teaches a CAN system comprising a common bus (e.g. CAN-H line 11 and CAN-L line 12 of Fig. 1 and Fig. 7) having an end termination with a termination hub for electrically terminating (e.g. electrically terminated via resistor 41 of Fig. 1 and R of Fig. 7) the common bus (col. 1, l. 23 and col. 2, l. 42).

It would have been obvious for one of ordinary skill in this art, at the time of invention was made to include Suganuma's electrical termination into AAPA and Sitte's CAN system, not only because it is a requirement for the CAN system's communication bus to be properly terminated at the end, but also for the benefit of having an enhanced fail-safe performance for a break failure of the two-wire communications line (Suganuma, col. 2, ll. 60-65) to obtain the invention as specified in claim 1.

15. As per claim 3, AAPA, Sitte and Suganuma teach all the limitations of claim 1 as discussed above, where Sitte further teaches the control system comprising wherein each one of the cable units comprises a cable having at least one electrical connector at each end (Sitte, Fig. 1; col. 7, l. 8 to col. 8, l. 51; and col. 15, l. 18 to col. 17, l. 49), as the plurality of cable segments (Sitte, Fig. 1, ref. 31, 33, 35 and segments between the T-connectors in Fig. 1) each have the correspond electrical connector at each end for proper connection as the devices may need to be replaced or the new device is added.

16. As per claim 4, AAPA, Sitte and Suganuma teach all the limitations of claim 1 as discussed above, where Sitte further teaches the control system comprising wherein the common bus further comprises at least one distribution hub (Sitte, Fig. 1, ref. 15, 17, 20)

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which is removably connectable to the at least one modular cable unit (Sitte, Fig. 1; col. 7, l. 8 to col. 8, l. 51 and col. 15, l. 18 to col. 17, l. 49).

17. As per claim 8, AAPA, Sitte and Suganuma teach all the limitations of claim 3 as discussed above, where Sitte further teaches the control system comprising wherein said at least one electrical connector is removably connectable to at least one of said plurality of devices (Sitte, Fig. 1; Fig. 11 and col. 15, l. 18 to col. 17, l. 49).

18. As per claim 9, AAPA, Sitte and Suganuma teach all the limitations of claim 1 as discussed above, where Sitte further teaches the control system comprising wherein the common bus comprises a CAN (controller area network) bus (Sitte, col. 4, ll. 1-38).

19. As per claim 11, AAPA, Sitte and Suganuma teach all the limitations of claim 1 as discussed above, where AAPA further teaches the control system wherein at least one of said plurality of devices comprises an electro-hydraulic pod (AAPA, Specification, p. 1, ll. 8-33).

20. As per claim 12, AAPA, Sitte and Suganuma teach all the limitations of claim 1 as discussed above, where AAPA and Sitte further teach the control system comprising wherein at least one of said plurality of devices comprises an actuator (AAPA, Specification, p. 1, ll. 8-33 and Sitte, col. 2, l. 59 to col. 3, l. 5; col. 7, l. 8 to col. 8, l. 51).

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21. As per claim 13, AAPA, Sitte and Suganuma teach all the limitations of claim 1 as discussed above, where AAPA and Sitte further teach the control system comprising wherein at least one of said plurality of devices comprises a sensor (AAPA, Specification, p. 1, ll. 8-33 and Sitte, col. 2, l. 59 to col. 3, l. 5; col. 7, l. 8 to col. 8, l. 51).

22. As per claim 16, AAPA teaches a control system for a subsea installation, the control system comprising:

a control module (Specification, p. 1, ll. 8-33); and

a plurality of devices (e.g. sensors, actuators) which are connected to the control module (Specification, p. 1, ll. 8-33).

AAPA does not teach the control system comprising: a common bus ... the plurality of devices are each removably connectable to the common bus ... a bus controller having a unique address ... comprises a junction and a plurality of branch cables ... at least two control supply cables ... .

Sitte teaches a control system comprising:

a common bus (Fig. 1, ref. 10 and Fig. 11, ref. 770, 772, 780, 782) which is connected to a control module (e.g. programmable control logic (PLC) 12 of Fig. 1) and which comprises at least one cable unit (e.g. cable unit between the T-connectors), (Fig. 1; col. 7, l. 8 to col. 8, l. 51 and col. 15, l. 18 to col. 17, l. 49); and

a plurality of devices (Fig. 1, ref. 14, 16, 18-19, 21-22, 26-27, 29-30, 34) which are each removably connectable (e.g. via replacement or addition) to the cable unit (col. 7, l. 8 to col. 8, l. 51 and col. 15, l. 18 to col. 17, l. 49);

wherein each one of the devices comprises a bus controller having a unique address (e.g. identification bits) (Fig. 5-8, ref. 220-230; Fig. 11, ref. 220-230; col. 4, ll. 63-66; col. 11, l. 46 to col. 13, l. 22 and col. 15, l. 18 to col. 17, l. 49);

wherein the control module (Fig. 1, ref. 12) comprises means for communicating with each one of the devices over the common bus (Fig. 5-8, ref. 220-230; Fig. 11, ref. 220-230; col. 7, l. 8 to col. 8, l. 51; col. 9, ll. 39-64; col. 13, ll. 17-22 and col. 15, l. 18 to col. 17, l. 49), as the programmable control logic communicate via forwarding commands to the devices or receiving data from the devices; and

wherein the cable unit comprises a junction (Fig. 1, ref. 20), and a plurality of branch cables (e.g. branch cables connected to the corresponding devices 22, 26, 30, 34 of Fig. 1), each of the plurality of branch cables comprises a first end that is connected to the junction (e.g. the end of the branch cable connecting to the junction 20 of Fig. 1), and a second end that is connected to a corresponding electrical connector (e.g. the end of the branch cable that is connected to the device 22, 26, 30, 34 of Fig. 1) which in turn is removably connected (e.g. via replacement or addition) to one of the devices (Fig. 1, ref. 22, 26, 30, 34), wherein at least two control signal supply cables which each extend between said first and second ends and are connected to said junction and said corresponding electrical connector (e.g. at least two devices 22, 26, 30, 34 of Fig. 1 are connected to the junction 20 of Fig. 1 via the correspond electrical connector and one of the control signal supply cable, as the devices have the corresponding cable attached similar to that of cable 740 of Fig. 11 for supplying the

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control signal) (Fig. 1; Fig. 11; col. 4, ll. 39-45; col. 7, l. 8 to col. 8, l. 51 and col. 15, l. 18 to col. 17, l. 49).

It would have been obvious for one of ordinary skill in this art, at the time of invention was made to include Sitte's control system configuration into AAPA's subsea installation for the benefit of utilizing the Controller Area Network (CAN) protocol which permits efficient communication between individual devices including sensors and actuators at a faster data rate in a high security environment (Sitte, col. 2, l. 59 to col. 3, l. 5 and col. 4, ll. 1-38) to obtain the invention as specified in claim 16.

AAPA and Sitte do not teach the control system comprising: wherein each of the branch cables comprises said at least two control signal supply cables that are directly electrically connected to each other at said corresponding electrical connector.

Suganuma teaches a CAN system comprising wherein each branch cables comprises said at least two control signal supply cables that are directly electrically connected to each other at said corresponding electrical connector (Fig. 1; Fig. 7 and col. 1, l. 23 and col. 2, l. 42), by combining the branch cables in parallel interconnection configuration to the devices into AAPA and Sitte's control signal supply cables, the resulting combination teaches the control signal supply cable for one of the devices is directly connected to the control signal supply cable for another one of the devices in parallel, which have the equivalent electrical interconnection configuration as each of the branch cables having the at least two control signal supply cables that are connected at the corresponding electrical connector.



It would have been obvious for one of ordinary skill in this art, at the time of invention was made to include Suganuma's parallel interconnection with corresponding electrical termination into AAPA and Sitte's CAN system, not only because it is a requirement for the CAN system's communication bus to be properly terminated at the end, but also for the benefit of having an enhanced fail-safe performance for a break failure of the two-wire communications line (Suganuma, col. 2, ll. 60-65) to obtain the invention as specified in claim 16.

23. As per claim 17, AAPA, Sitte and Suganuma teach all the limitations of claim 16 as discussed above, where Sitte and Suganuma further teach the control system comprising wherein said branch cables further comprise at least two control signal return cables which extend between said first and second ends and are connected to said junction and said corresponding electrical connector (Sitte, Fig. 1; Fig. 11; col. 4, ll. 39-45; col. 7, l. 8 to col. 8, l. 51 and col. 15, l. 18 to col. 17, l. 49), having similar parallel interconnection configuration as the control signal supply cables.

24. As per claim 20, AAPA, Sitte and Suganuma teach all the limitations of claim 3 as discussed above, where Sitte further teaches the control system comprising wherein said corresponding electrical connector comprises a female connector (Sitte, col. 15, l. 18 to col. 17, l. 49), wherein the well known female type electrical connector may be implemented for allowing the devices to be removably connected.

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25. As per claim 21, AAPA, Sitte and Suganuma teach all the limitations of claim 3 as discussed above, where Sitte further teaches the control system comprising wherein said corresponding electrical connector comprises a male connector (Sitte, col. 15, l. 18 to col. 17, l. 49), wherein the well known male type electrical connector may be implemented for allowing the devices to be removably connected.

26. As per claim 22, AAPA, Sitte and Suganuma teach all the limitations of claim 3 as discussed above, where Sitte and Suganuma further teach the control system comprising wherein said corresponding electrical connector comprises a signal termination component (Sitte, Fig. 1; col. 15, l. 18 to col. 17, l. 49 and Suganuma, Fig. 1; Fig. 7; col. 1, l. 23 and col. 2, l. 42).

27. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Sitte (US Patent 5,469,150), Suganuma et al. (US Patent 7,349,479) as applied to claim 1 above, and further in view of Johnson et al. (US Patent 6,553,336).

AAPA, Sitte and Suganuma teach all the limitations of claim 1 as discussed above, where Sitte further teaches the control system comprising said plurality of devices (Sitte, Fig. 1, ref. 14, 16, 18-19, 21-22, 26-27, 29-30, 34; col. 7, l. 8 to col. 8, l. 51 and col. 15, l. 18 to col. 17, l. 49).

AAPA, Sitte and Suganuma do not teach the control system comprising wherein at least one of said plurality of devices comprises a battery.

Johnson teaches a system comprising wherein at least one of a plurality of devices (e.g. sensors/actuators) comprises a battery (col. 4, ll. 14-48 and col. 6, l. 53 to col. 7, l. 5).

It would have been obvious for one of ordinary skill in this art, at the time of invention was made to include Johnson's battery into AAPA, Sitte and Suganuma's plurality of device for the benefit of allowing quick and easy installation of the devices (Johnson, col. 4, ll. 40-42) to obtain the invention as specified in claim 10.

28. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Sitte (US Patent 5,469,150) and Longsdorf et al. (US Patent 6,006,338).

AAPA teaches a control system for a subsea installation, the control system comprising:

a control module (Specification, p. 1, ll. 8-33); and

a plurality of devices (e.g. sensors, actuators) which are connected to the control module (Specification, p. 1, ll. 8-33).

AAPA does not teach the control system comprising: a common bus ... the plurality of devices are each removably connectable to the common bus ... a bus controller having a unique address ... a junction and a plurality of branch cables ... at least two control signal cables ... a current loop ....

Sitte teaches a control system comprising:

a common bus (Fig. 1, ref. 10 and Fig. 11, ref. 770, 772, 780, 782) which is connected to a control module (e.g. programmable control logic (PLC) 12 of Fig. 1) and

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which comprises at least one cable unit (e.g. cable unit between the T-connectors), (Fig. 1; col. 7, l. 8 to col. 8, l. 51 and col. 15, l. 18 to col. 17, l. 49); and

a plurality of devices (Fig. 1, ref. 14, 16, 18-19, 21-22, 26-27, 29-30, 34) which are each removably connectable (e.g. via replacement or addition) to the cable unit (col. 7, l. 8 to col. 8, l. 51 and col. 15, l. 18 to col. 17, l. 49);

wherein each one of the devices comprises a bus controller having a unique address (e.g. identification bits) (Fig. 5-8, ref. 220-230; col. 4, ll. 63-66; col. 11, l. 46 to col. 13, l. 22 and col. 15, l. 18 to col. 17, l. 49);

wherein the control module (Fig. 1, ref. 12) comprises means for communicating with each one of the devices over the common bus (Fig. 5-8, ref. 220-230; Fig. 11, ref. 220-230; col. 7, l. 8 to col. 8, l. 51; col. 9, ll. 39-64; col. 13, ll. 17-22 and col. 15, l. 18 to col. 17, l. 49), as the programmable control logic communicate via forwarding commands to the devices or receiving data from the devices; and

wherein the cable unit comprises a junction (Fig. 1, ref. 20), and a plurality of branch cables (e.g. branch cables connected to the corresponding devices 22, 26, 30, 34 of Fig. 1), each of the plurality of branch cables comprises a first end that is connected to the junction (e.g. the end of the branch cable connecting to the junction 20 of Fig. 1), a second end that is connected to a corresponding electrical connector (e.g. the end of the branch cable that is connected to the device 22, 26, 30, 34 of Fig. 1) which in turn is removably connected (e.g. via replacement or addition) to one of the devices (Fig. 1, ref. 22, 26, 30, 34), and at least two control signal cables which each extend between said first and second ends and are connected to said junction and said

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corresponding electrical connector (e.g. wherein the devices 22, 26, 30, 34 of Fig. 1 are connected to the junction 20 of Fig. 1 via the correspond electrical connector and the corresponding control signal cables 746-747 of Fig. 11, as the devices have the corresponding cable attached similar to that of cable 740 of Fig. 11) (Fig. 1; Fig. 11; col. 4, ll. 39-45; col. 7, l. 8 to col. 8, l. 51 and col. 15, l. 18 to col. 17, l. 49).

It would have been obvious for one of ordinary skill in this art, at the time of invention was made to include Sitte's control system configuration into AAPA's subsea installation for the benefit of utilizing the Controller Area Network (CAN) protocol which permits efficient communication between individual devices including sensors and actuators at a faster data rate in a high security environment (Sitte, col. 2, l. 59 to col. 3, l. 5 and col. 4, ll. 1-38) to obtain the invention as specified in claim 19.

AAPA and Sitte do not teach the control system comprising: wherein each of said control signal cables comprises a current loop which is routed through each said corresponding electrical connector and said junction.

Longsdorf teaches a control system comprising wherein each of said control signal cables comprises a current loop (e.g. loop current) which is routed through each said corresponding electrical connector and said junction (Fig. 1-2; col. 3, l. 29 to col. 4, l. 50 and col. 5, ll. 24-30), by combining the loop current with AAPA and Sitte's control signal cables configuration, the loop current is then routed through each AAPA and Sitte's corresponding electrical connector and junction.

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It would have been obvious for one of ordinary skill in this art, at the time of invention was made to include Longsdorf's loop current into AAPA and Sitte's subsea installation for the well known benefit that current loop provides accurate signaling and able to supply power to the devices, as well as for the benefit of having a self diagnostic and set-up process transmitter that is able to communicate when there is inadequate power on the process link (Longsdorf, col. 2, ll. 29-36) to obtain the invention as specified in claim 19.

#### **VII. PERTINENT PRIOR ART NOT RELIED UPON**

Pihet (US Pub.: 2004/0158781)

Croft et al. (US Patent 5,974,351)

Barrenscheen et al. (US Patent 7,017,072)

Beierle (US Patent 7,218,892)

**VIII. CLOSING COMMENTS**

**Conclusion**

**a. STATUS OF CLAIMS IN THE APPLICATION**

The following is a summary of the treatment and status of all claims in the application as recommended by **M.P.E.P. 707.07(i)**:

**a(1) CLAIMS REJECTED IN THE APPLICATION**

Per the instant office action, claims 1, 3-4, 8-13, 16-17 and 19-22 have received a first action on the merits and are subject of a first action non-final.

**b. DIRECTION OF FUTURE CORRESPONDENCES**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chun-Kuan (Mike) Lee whose telephone number is (571) 272-0671. The examiner can normally be reached on 8AM to 5PM.

**IMPORTANT NOTE**

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alford Kindred can be reached on (571) 272-4037. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

March 11, 2009

Chun-Kuan (Mike) Lee  
Examiner  
Art Unit 2181

/Chun-Kuan Lee/

Examiner, Art Unit 2181